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Feasibility, acceptability and cost efficiency of using webinars to deliver first-line patient education for people with Irritable Bowel Syndrome as part of a dietetic-led gastroenterology service in primary care

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Abstract

Background: Irritable bowel syndrome (IBS) is a chronic functional gastrointestinal disorder. International research suggests dietary intervention as a first line approach, but dietetic services are struggling to cope with demand. Digital technology may offer a solution to deliver appropriate patient education.

Aim: To assess the feasibility, acceptability and cost efficiency of using webinars to deliver first line IBS advice to patients as part of a dietetic-led gastroenterology service in primary care.

Methods: Patients were directed to an IBS First Line Advice webinar on a specialist NHS website. Data were collected from patients pre and post webinar use using an on-line survey.

Results: A total of 1171 attendees completed the pre-webinar survey and 443 completed the post-webinar survey. Attendees ranged from under 17 to over 75 years. 95% found the webinar easy to access, and 91% were satisfied with the content of the webinar. Those with excellent or good knowledge rose from 25% pre-webinar to 67% post-webinar, confidence in managing their condition improved for 74% of attendees. Using the webinars led to a 44% reduction in referrals for one to one appointments with a specialist dietitian in the first year of use. The value of the clinical time saved is estimated at £3,593 per annum. The cost of creating the webinar was £3317.

Conclusion: The use of webinars was a feasible, acceptable and cost-efficient way of delivering first line patient education to people suffering with Irritable Bowel Syndrome as part of a dietetic-led gastroenterology service in primary care.

26 **Introduction**

27 Irritable Bowel Syndrome (IBS) is a non-life-threatening chronic and relapsing functional
28 gastrointestinal disorder with a global prevalence of 11% ⁽¹⁾. The burden on health care systems and
29 society worldwide is substantial. Data shows that in the United Kingdom (UK) the estimated total
30 annual costs for IBS treatment ranges from £45.6 million to £200 million ⁽¹⁾. In the United States of
31 America (USA) 25-49% of IBS patients will consult a primary care general practitioner (GPs) each
32 year with reattendance being common ⁽²⁾. In the UK, despite guidance from the National Institute for
33 Health and Care Excellence (NICE), around half of IBS patients continue to be inappropriately
34 referred for endoscopic investigation ⁽³⁾ with IBS accounting for 36% of all new patient referrals to
35 gastroenterologists ⁽¹⁾.

36
37 Since 2008 UK NICE guidance has recognised dietary intervention as a successful first line approach
38 for IBS with subsequent professional guidelines establishing clear pathways for the dietary treatment
39 of IBS patients ^(4, 5). However, delivery of this treatment requires dietetic input and the demand
40 currently exceeds capacity despite the use of alternative approaches, such as group sessions. Because
41 many dietetic departments are unable to cope with demand the burden continues to fall on GP and
42 secondary care services ^(6, 7). A solution is required to deliver high quality dietetic advice to the large
43 patient population as a first line intervention, freeing up time for specialist care of more complex or
44 intractable cases.

45 Due to the advancement and broad adoption by the public of digital technologies, the UK National
46 Health Service (NHS) is embracing digital transformation as a way to meet increasing demand in a
47 financially restricted environment ^(8, 9). Up to 75% of the population now seek health information
48 online and convenient access is becoming an expectation ⁽¹⁰⁾. Virtual education shifts responsibility
49 to the patient and can overcome many of the barriers to face to face education, such as lack of mobility
50 or time, distance to travel to attend appointments, lack of funds, long waiting lists for appointments,
51 and caring commitments ^(10, 11). Evidence suggests that some patients actually prefer remote contact
52 with health care providers rather than travel to appointments ⁽¹²⁾. The use of pre-recorded on-demand
53 webinars allows access to virtual health education for unlimited numbers of patients, enabling self-
54 care using appropriate expert formulated advice at first point of need, and potentially releasing time
55 across the health care system.

56 This project aimed to assess the feasibility, acceptability and cost efficiency of using webinars to
57 deliver first line advice to patients with suspected or newly diagnosed IBS.

59 **Methods**

60

61 A single-group pre-post study design was used to evaluate the feasibility, acceptability and cost
62 efficiency of a webinar as the first line advice for people with IBS in primary care. The webinar
63 directly reflected first line IBS advice from the 2016 British Dietetic Association evidence based
64 practice guidelines for the dietary management of IBS in adults.⁽¹³⁾ Data were collected between 26th
65 March 2018 and 15th April 2020. The project is registered as a service evaluation with Somerset
66 Partnership NHS Foundation Trust and data were collected anonymously, therefore further ethical
67 approval was not required.

68

69 Health care professionals (HCPs) working locally referred adult patients (aged of 18 years and over)
70 with IBS to a newly developed 'IBS First Line Advice' webinar hosted on the NHS Community
71 Dietetic website. Carers or friends were directed to the website if appropriate in order to support the
72 patient. Before and after completion of the webinar individuals were given the option to complete an
73 anonymous survey.

74

75 **Developing the webinar**

76 A webinar subscription was acquired with Go To Webinar Pro Version (LogMeIn, Inc. Boston, MA,
77 USA) and the webinar platform was approved for use by Somerset Partnership NHS Foundation Trust
78 Information Governance. An un-branded webinar was recorded using a PowerPoint (Microsoft
79 Corporation, Redmond, Washington, USA) presentation delivered by three specialist
80 gastroenterology community dietitians (MW, CM, LS). The recording was edited and uploaded to
81 the YouTube channel, 'Patient Webinars'. The YouTube link was then embedded into the community
82 dietetic department website. With access to 4G or Wi-Fi, the webinars were then available 'on-
83 demand' to any patient via smart phone, laptop, tablet or computer at a time and place of their
84 choosing. Patients could also download patient education resources directly from the website, for
85 example NICE accredited dietary advice, constipation advice, information on additional dietary
86 approaches etc.

87

88 The cost of creating the webinar was £3,597, including the webinar subscription (£2,363/year),
89 microphone (£120 one-off cost), business card cost (£280 one-off cost), and staff costs (£834). (See
90 *Supplementary Information 1* for illustration of the staff time and process used to create the webinar).

91

92 Local GPs and other HCPs were given the website address and asked to direct adult patients to the
93 website if the patient needed first line IBS advice. No referral letter was necessary from the referring
94 clinician. To ensure that HCPs were aware of the webinar, emails with the website address were sent

95 monthly to all Somerset senior GPs, practice managers, pharmacists and health visitors. Business
96 cards were created for HCPs to give to patients with the website address and these were distributed
97 to secondary care gastroenterology departments, endoscopy nurses, pharmacists, acute dietitians and
98 GPs locally. Talks were given at county-wide GP education days highlighting the webinar and the
99 website.

100

101 **Data Collection**

102 Pilot pre and post IBS webinar surveys were developed using Survey Monkey between 29th June
103 2017 and 19th February 2019 with data collect from 112 patients pre webinar and 66 patients post
104 webinar. Data for this service evaluation was then collected between 26th March 2018 and 15th April
105 2020 using Questback (Questback, Bridgeport, USA).

106

107 Basic demographic data were collected including: age; gender; location within the UK; who gave the
108 webinar details to the patient; whether IBS had been diagnosed by an HCP; whether the patient was
109 registered with a Somerset GP; whether the webinar was being accessed by a patient, carer, friend or
110 HCP. HCPs and carers were noted and then automatically directed out of the survey and were not
111 included in the survey outcome data.

112

113 The surveys focused on collecting data on accessibility, acceptability, knowledge, confidence and
114 examined use of health care services. Survey questions allowed for only one answer per question with
115 the exception of questions 8 and 14 where multiple answers were allowed. (See *Supplementary*
116 *Information 2* for the survey questions). Patients were also asked what other information, if any, they
117 would like to see included in the webinar. This information was regularly reviewed in order to ensure
118 that the webinar was meeting patient needs. (See *Supplementary Information 5* for patient answers)

119

120 Data were also collected for referral rates to the dietetic-led gastroenterology service for one-to-one
121 appointments for the year prior and year following the launch of the webinar. The estimated value
122 of dietetic time in clinic was calculated using figures for an NHS band 6 dietitian for 2017 to 2019
123 including on-costs (approximately £23.18/hr).

124

125 Data were analysed using SPSS (IBM, New York, USA) and are presented as frequencies.

126 Comparisons between pre and post surveys compare proportions in two unequal samples using
127 medcalc.org comparisons of proportions calculator.

Results

The IBS webinar was viewed 2,300 times via the local NHS website, between 1st July 2017 and 17th March 2020. A total of 1171 attendees accessed the pre-webinar survey and 443 (38%) engaged with the post-webinar survey. There is no record of the number of patients who were offered the webinar but did not access it. The majority of patients had been diagnosed with IBS by a HCP (68%) and of those that completed the post webinar survey most were registered with a Somerset GP (84%). Respondents were principally female (75%). (See *Supplementary Information 3* for details on age, location of the patient, referral source and whether the attendee was a patient, carer or health care professional).

Figure 1a, b, c, & d highlight the patient acceptability of using the webinar. The majority of patients found the webinar easy to join, were satisfied with the overall content, and would recommend the webinar to friends with IBS. Reasons for attending the webinar were varied but the most frequently cited were access to accurate and reliable information, ability to re-watch the webinar, and that there was no need to travel or take time off work.

The change in patient confidence and knowledge in managing their IBS symptoms with diet is shown in figure 2a and 2b. This data shows that patients' confidence and knowledge increased after the webinar. The categories were dichotomised (very, fairly and some level of confidence=confident; Neither, not and not at all confident=Not confident. Excellent, good, fair knowledge=good; limited, poor, no knowledge=poor). 45% (n=1171) were not confident to manage their IBS pre-webinar and this decreased to 16% (n=375) post-webinar (difference=29% (95% CI: 24-34%) $p<0.0001$). 44% (n=1171) reported poor knowledge pre-webinar and this decreased to 5% (n=443) post-webinar (difference=39% (95% CI: 35-43%) $p<0.0001$).

Figure 3a & b show results of questions testing specific knowledge, which indicate whether patients listened, assimilated and understood information in the webinar. 25% (n=1171) participants pre-webinar correctly identified allergy testing was ineffective but 70% (n=375) post-webinar could answer this question correctly (difference=45% (95% CI: 39-50%) $p<0.0001$). Low lactose diet was identified correctly as effective by 35% (n=1170) pre and 78% (n=375) post (difference=43% (95% CI: 38-48%) $p<0.0001$); low FODMAP diet 71% pre 65% post (difference=5% (95% CI: 0.04-11%) $p<0.05$); low fructan diet 24% pre 82% post (difference=58% (95% CI: 53-62%) $p<0.0001$).

Figure 4 shows how attendees adjusted their understanding of which healthcare professional would be most useful to seek advice from for IBS. Reliance on GPs and secondary care gastroenterology

164 reduced, whilst the understanding that a specialist dietitian was the most appropriate professional
165 increased. Assuming 'specialist dietitian' is the correct answer; 62% (n=1171) were correct pre-
166 webinar and 86% (n=375) post-webinar (difference=24% (95% CI: 19-28%) p<0.0001).

167

168 Patients were also asked if they would like to attend a webinar specifically on the low FODMAP diet;
169 64% of patients confirmed they would and a further 27% answered 'maybe'.

170

171 Patients reported what other information they would like to see included in the webinar (*See*
172 *Supplementary Information 5* for answers from patients).

173

174 In the year before the webinars were available, September 2016 to August 2017, the dietetic-led
175 gastroenterology service received 350 referrals. In the year following the availability of the webinar,
176 September 2017 to August 2018, 195 referrals were received into this service, showing a 44% drop
177 in referral numbers. The value of the dietetic time saved by this project is estimated at £2,759 per
178 annum. The time saved as a result of the reduced referral rate has allowed the provision of a service
179 for patients with coeliac disease and inflammatory bowel disease in remission, which were both
180 previously unmet needs. (*See Supplementary Information 4* for financial modelling showing money
181 saved with the use of dietetic IBS first line advice webinar).

182 **Discussion**

183

184 This service evaluation showed that the delivery of a webinar as the first form of patient education to
185 those diagnosed with IBS in primary care was feasible, acceptable and cost effective. The webinar
186 was feasible to develop and incorporate into a clinical dietetic service with very modest set up costs.
187 It was acceptable to patients in a number of ways and data indicated that patients' knowledge
188 improved. The cost of development and delivery of the webinar were more than off-set by time
189 savings, which were significant enough to allow the expansion of the service to other patient groups.

190

191 The growth of internet use is changing the landscape of global health care and health seeking
192 behaviour; 60% of people surveyed acknowledged that online advice would influence their health
193 care decisions ⁽¹⁴⁾. One in three adults in the USA use the internet to diagnose or learn about a health
194 concern ⁽¹⁵⁾, and over 83% of Europeans look on-line for health information ^(16, 17). UK research
195 indicates that patients are increasingly happy to embrace new technology, such as video consultations
196 with their GP ^(14, 18). Webinars are a simple and effective digital innovation potentially offering
197 populations unprecedented immediate access to health advice. It is acknowledged that trust and
198 confidence in online information remain important ⁽¹⁹⁻²¹⁾ and these webinars give patients convenient
199 remote access to the most up-to-date guidelines and evidence-based advice directly from specialists
200 working in the field. The most common reason for attending the webinars was 'access to accurate
201 and reliable information' reflecting the patients' trust in the information provided. This corresponds
202 with international research underlining the desire for easy access to trustworthy health care on the
203 internet ^(15, 20, 21). This need for trustworthy information also highlights the importance of specialist
204 health care professionals developing the content and delivering the patient-focused webinars.

205

206 During the evaluation period over 2,300 people viewed the webinar indicating that it was a feasible
207 form of patient education. Furthermore the vast majority of patients found the webinar easy to use
208 and would recommend it. All ages were represented in the sample, with a maximum 14% difference
209 in the numbers accessing the webinar aged between 25-74 years. Recent research suggests that age
210 is not a barrier to technology use ⁽¹¹⁾ and this is reflected in our results; 33% of the sample were aged
211 55-74 years. Research shows that IBS is a more common disease in women with an odds ratio of
212 1.67. Our data showed a 75% female dominance which is higher than expected and may reflect a
213 male reluctance to engage in online education and/or a female response bias to completing
214 questionnaires. ^(3, 22)

215

216 The on-demand webinar could be accessed unlimited times at any time of day, making this an easy
217 and convenient way to encourage patient self-management and consolidate knowledge, allowing

218 patients to take the time they required to make sense of the complex medical and dietary information
219 ⁽²³⁾. This approach may be particularly useful in chronic health conditions ^(11, 23) such as IBS, and
220 may explain why the ability to re-watch the webinar was the second most popular reason for accessing
221 this form of patient education. Our data demonstrates that not only did attendees self-report an
222 improvement in their knowledge after accessing the webinar, they also showed an increase in the
223 proportion of correctly answered test questions post webinar, suggesting that the attendees had
224 listened, assimilated and understood the information. Research shows that virtual education may be
225 as effective or more effective than a routine physician appointment. It may be that the opportunity to
226 re-watch the webinar and consolidate knowledge in part explains this finding ⁽¹⁰⁾. The increase in
227 knowledge is also likely to be associated with the improvements seen in self-reported confidence

228 Odata showed clearly that preventing the need to travel and preventing the need to take time off work
229 were important to patients who accessed the webinars. Travelling to appointments may pose a
230 significant problem in both rural and urban areas to those who have limited mobility, insufficient
231 funds, lack of access to transport, lack of child or respite care cover or other time constraints. For
232 these patients on-demand webinars could significantly improve access to health education allowing
233 them to choose when and where they attend ⁽¹⁸⁾.

234 The overwhelming majority of patients were satisfied with the content of the webinar and most would
235 recommend it to friends, indicating that patients found the webinar acceptable. Additional comments
236 on the survey consistently suggested that webinar content was comprehensive and extensive (see
237 *Supplementary Information 5*). Requests for further information were focused predominantly on
238 second-line dietary advice, specifically the low FODMAP diet. Based on this feedback we created a
239 low FODMAP diet webinar (available at www.patientwebinars.co.uk), which has had 6,000 views in
240 the first 12 months, suggesting that the feedback from our sample reflected a need in the general IBS
241 population.

242 The symptoms of IBS e.g. abdominal pain, bloating, stool changes, can be very similar to those of
243 bowel or ovarian cancer and inflammatory bowel disease, and are likely to explain why 4% of those
244 identified with IBS are later diagnosed with a serious organic disorder ⁽²⁴⁾. Hence, any symptoms
245 suggestive of more serious pathology (also known as ‘red flags’) such as blood in stools, unintended
246 weight loss, unexplained low iron levels should be further investigated. For this reason, the webinar
247 clearly informs patients of these ‘red flags’, to ensure patient safety by encouraging earlier care (see
248 figure 5). Feedback indicated that patients did understand the safety issues, as illustrated by this quote,
249 “I need to see my GP as I have some of what you call red flags.”

250 Recent systematic reviews from Australia and Canada have found that virtual education can lead to
251 a more efficient use of clinical time offering a direct alternative to seeing an HCP face-to-face ^(10, 11),
252 a finding that is supported by our data showing a 44% reduction in face-to-face referrals into the
253 dietetic-led gastroenterology service in the first year following the start of the webinars. This
254 significant release in clinical time has allowed the dietetic team to assess unmet needs, leading to new
255 regional care pathways for both coeliac disease and inflammatory bowel disease in remission.
256 Additionally, from a cost-saving perspective, this cohort of patients did not require administration of
257 appointments and could download resources directly from the website on to their own device, leading
258 to further savings from printing and postage costs. NHS estates costs for room hire, staff and patient
259 travel costs, parking and patient time should also be considered in any long-term financial savings
260 assessments.

261 Other data from evaluation of face-to-face IBS group sessions shows that patients are frequently
262 uncomfortable discussing bowel related symptoms in a group environment (unpublished data). The
263 webinar allows anonymity, a factor identified as a reason for attending the webinar. This factor may
264 explain the stark contrast between numbers of patients engaging in the different forms of patient
265 education: only 48 patients attending monthly in-person group sessions over a 20 month period
266 utilising only 22% of possible capacity ⁽⁷⁾.

267 The un-branded IBS webinar is now also available on [www.nhs.uk/conditions/irritable-bowel-](http://www.nhs.uk/conditions/irritable-bowel-syndrome-ibs/ibs-diet-video-guide/)
268 [syndrome-ibs/ibs-diet-video-guide/](http://www.nhs.uk/conditions/irritable-bowel-syndrome-ibs/ibs-diet-video-guide/) and has had over 32,000 views between April 2019 and April
269 2020. Access on this national website is further enabling other UK departments to use the webinar
270 free of charge. This prevents the need for replication of identical webinars by different Clinical
271 Commissioning Groups (CCG), and importantly allows departments to benefit from financial savings
272 without the need for developmental costs. The 44% drop in referral rates led to a £3.5K staff cost
273 saving in our small service. However, the real difference will come when the concept of webinars is
274 scaled up and rolled out nationally to other larger areas of need, for example musculoskeletal back pain,
275 diabetes, cardiovascular disease, or post-cancer care, particularly allowing for a reduction in follow-
276 up reviews after hospital procedures and ongoing specialist input for long term health conditions ⁽⁸⁾.
277 The 2019 NHS Long Term Plan aims to remove a third of face-to-face hospital outpatient
278 appointments, equivalent to 30 million outpatient visits per year, freeing up significant clinical time
279 and allowing outpatient teams to work differently ⁽⁸⁾. Reduction in referrals through the use of
280 webinars could significantly contribute to this release in clinical time (see Figure 5), while money
281 saved could lead to effective reallocation of clinical funding at a national level. It would be logical
282 for NHS UK to act as a site for a national repository of webinars in the long term, but this requires
283 further discussion.

284 The webinar specifically sought to educate patients on who to consult for IBS advice, and results
285 showed that patients felt that a specialist dietitian was the most appropriate healthcare professional to
286 deliver dietary advice for IBS. This is an important finding because it is well known that the high
287 costs of treating IBS are associated with inappropriate reliance on GPs and secondary care ⁽²⁵⁻²⁸⁾. One
288 in twelve GP consultations are for gastrointestinal problems and IBS is by far the most common
289 gastrointestinal condition seen by GPs ⁽²⁹⁾. Therefore, the demand on GP time can be addressed by
290 dietitian-led treatment including the use of webinars in order to manage the IBS workload in primary
291 care. Evidence already highlights the ability of dietitians to work autonomously and effectively with
292 IBS patients in a one-to-one setting in primary care, assessing patients without medical
293 correspondance, recommending appropriate treatment and/or onward referral ⁽³⁰⁾. The webinars are a
294 further development of this role, providing patients with faster access to the right care while
295 encouraging patient self management and reducing the need for expensive referrals to secondary care.
296 Care of IBS is an example of where dietitians could take on roles as first contact practitioners (FCP)
297 in the frontline of general practice in order to reduce GP workload.

298

299 The data collected for this feasibility study has several limitations. The anonymity of the on-line data
300 collection made it impossible to cross-match responses pre and post webinar; we do not know which
301 post resposes match which pre responses. The data collection also does not allow for long term follow
302 up of patients to determine if watching the webinar led to improvements in symptoms; this should
303 form the basis for future research. Only 38% of those completing the pre-survey completed the post-
304 survey and data collection did not allow assessment of the numbers of people who opted out of the
305 surveys or who declined to engage with the webinar. This may mean there are inherent biases related
306 to the type of person who was willing to complete both surveys.

307 From an equity accessibility perspective, it would be important to now look at ways of making these
308 webinars available to all patient groups including other languages, those with hearing and/or sight
309 disability. Discussions are already ongoing with the Deafness Support Network and NHS UK.

310 **Conclusion**

311

312 Patient webinars for first line advice for IBS are an innovative and novel use of digital technology
313 offering those with IBS unprecedented access to patient education. At very little cost to the health
314 service patients can increase their knowledge and confidence with trustworthy dietitian-led advice,
315 while providing a simple cost-effective solution to help release time across the health care system.
316 As virtual communication becomes ubiquitous within society, the use of this form of patient
317 education is likely to become mainstream, enabling patient’s needs to be addressed as early as
318 possible and empowering patients to better self-manage and understand their condition, potentially
319 leading to improved clinical outcomes. More research is urgently needed to better assess the benefits,
320 feasibility and challenges of implementing this technology at scale.

321

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- 403

Figure 1a: Patient feedback on how easy it was to join the webinar n=443

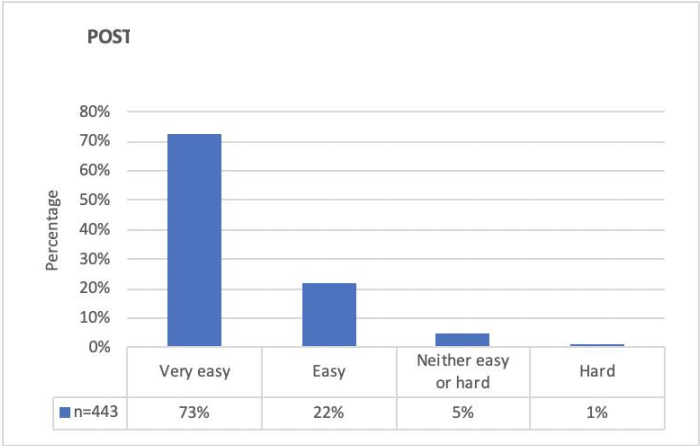


Figure 1b: Patient feedback on how satisfied they were with the overall content of the webinar n=443

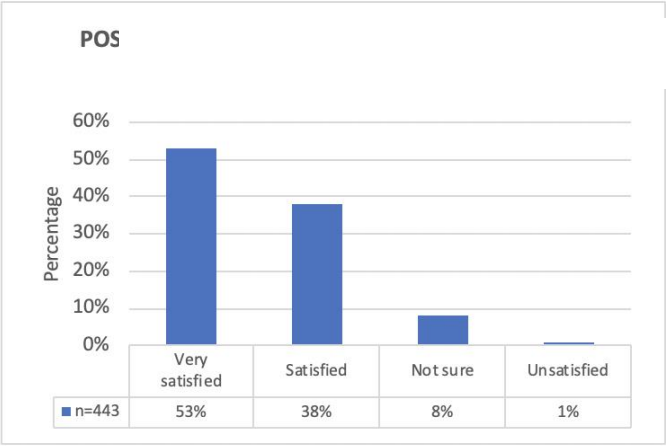


Figure 1c: Patient feedback on how likely they were to recommend the webinar to a friend suffering with IBS n=443

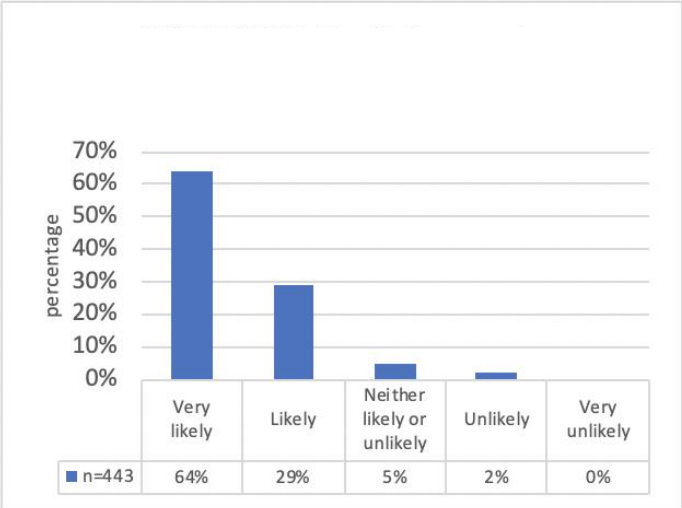
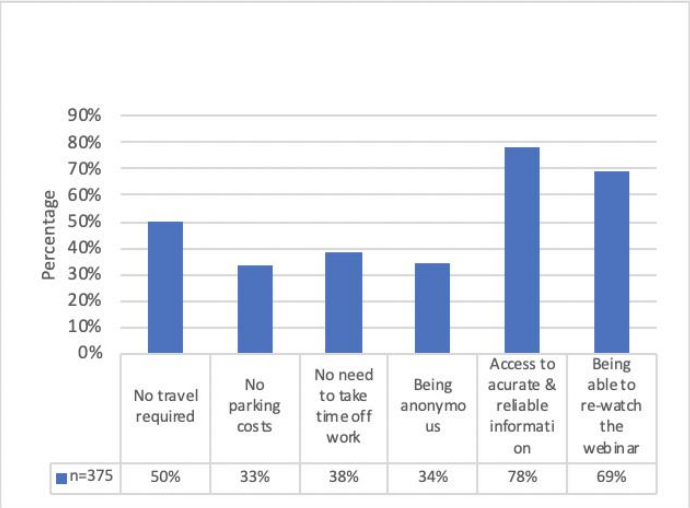


Figure 1d: Patient feedback on which factors were important to them when choosing to attend the webinar n=375



In figures 1d: patients could choose more than one answer

Figure 2a: Patient feedback comparing answers before and after watching the webinar how confident they were in managing their IBS symptoms. Pre n=1171 and Post n=375

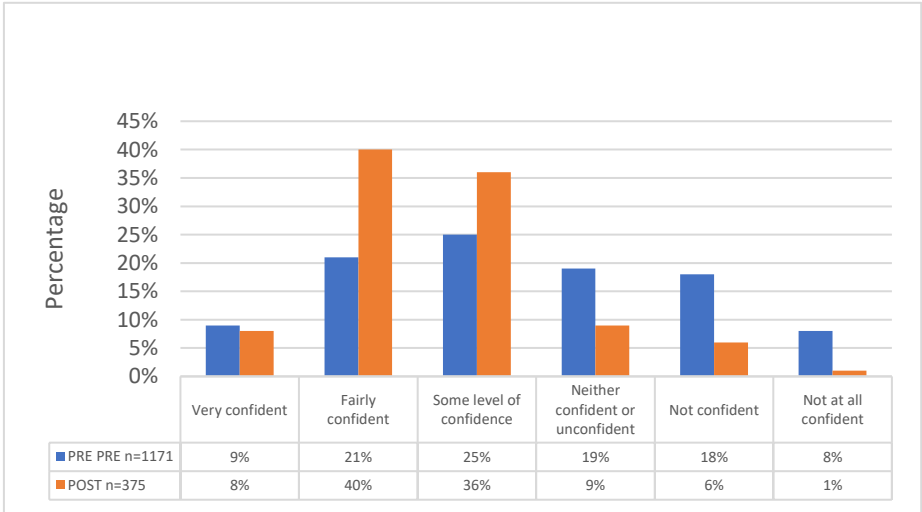


Figure 2b: Patient feedback comparing answers before and after watching the webinar on how they would rate their knowledge on managing their IBS symptoms through diet. Pre n=1171 and Post n=443

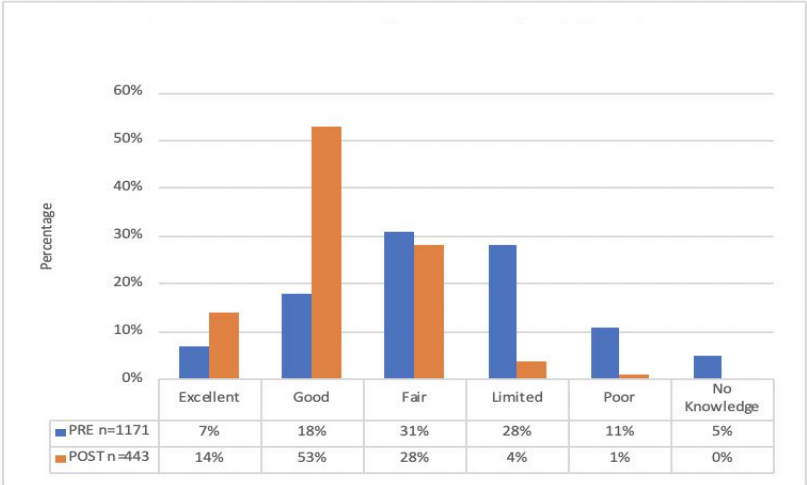
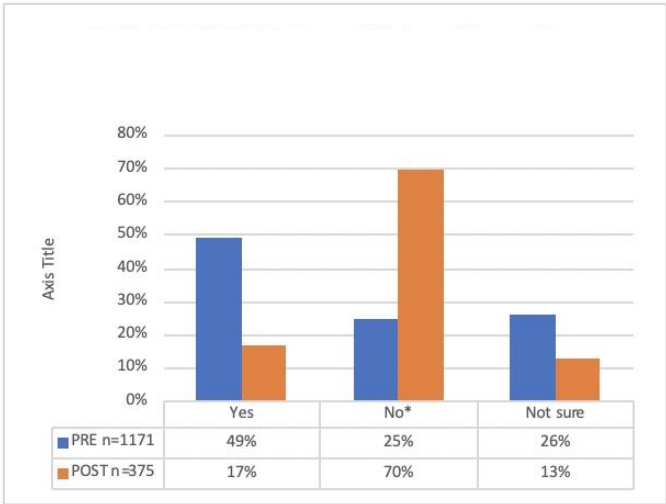
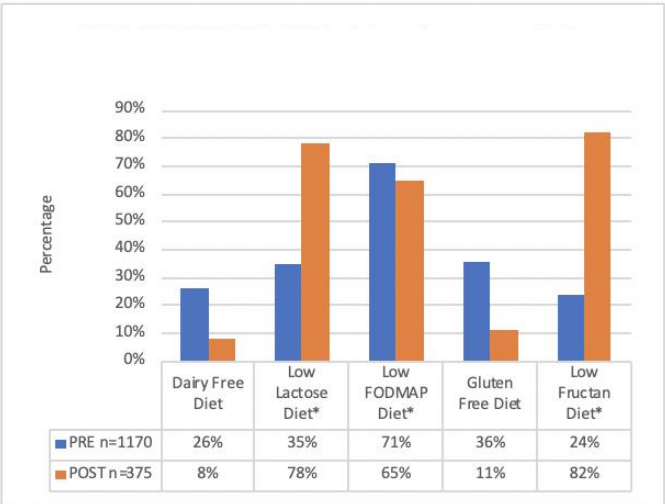


Figure 3a: Patient feedback comparing answers before and after watching the webinar on whether they would find it useful to have access to allergy testing in order to find a solution for their IBS symptoms. Pre n=1171 and Post n=375



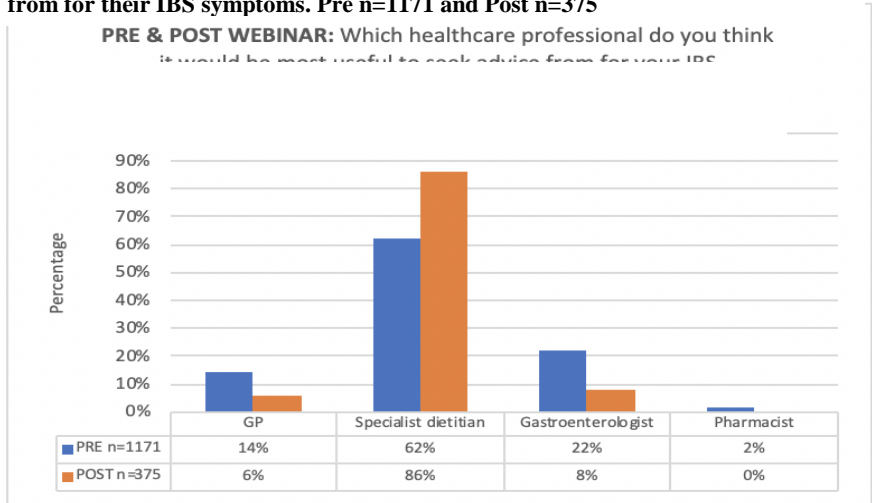
In figure 3a: use of * indicates the correct answer

Figure 3b: Patient feedback comparing answers before and after watching the webinar on which diets are most likely to help them in managing their IBS symptoms. Pre n=1170 and Post n=375



In figure 3b: use of * indicates the correct answer.
In figure 3b: patients could choose more than one answer

Figure 4: Patient feedback comparing answers before and after watching the webinar on which healthcare professional would be most useful to seek advice from for their IBS symptoms. Pre n=1171 and Post n=375



406 **Figure 5: This diagram shows the potential benefits to the health care system of using webinars**
407 **for first line IBS patient education**

